



# OHIO DEPARTMENT OF HEALTH

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John R. Kasich / Governor

Theodore E. Wymyslo, M.D. / Director of Health

July 6, 2012

Steven Renninger, On-Scene Coordinator  
U.S. Environmental Protection Agency  
Emergency Response Branch  
26 West Martin Luther King Drive (G41)  
Cincinnati, OH 45268

Dear Steve:

Per your request, ODH HAS is providing screening levels for the contaminants of concern in indoor air and sub-slab soil gas for properties at South Dayton Dump in Dayton, Ohio.

The values listed in the tables are expressed in micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) and parts per billion (ppb). We prefer the use of ppb, as we believe it is more easily understood by the general public. Based on the Region 5 guidance, we are giving you both screening levels and action levels for assessing vapor intrusion sites:

**Screening Levels** are based on  $10^{-5}$  cancer risk or hazard index of 1.0. Screening levels represent concentrations of a substance that are unlikely to cause harmful (adverse) health effects in exposed people. Detections in indoor air below these levels are not of a health concern. When available, our screening levels were taken from ATSDR's minimal risk levels (MRLs) and cancer risk evaluation guides (CREGs). Other sources include the U.S. EPA's reference concentrations (RfCs), regional screening levels (RSLs); and, in the case of cis-1,2-DCE, the 2002 OSWER Vapor Intrusion Guidance.

**Action Levels** are based on  $10^{-4}$  cancer risk and hazard index of 10. Detections in indoor air that exceed this level would lead to a recommendation for actions to reduce exposure in a relatively short period of time. Detections below the action level, but above the screening level would be referred to the EPA Remedial program or to the state for evaluation.

Also included are corresponding values for non-residential buildings – spaces that are not used for residences or where children are not continuously present. Non-residential buildings include commercial businesses and public buildings, churches, non-manufacturing businesses, and industries where these chemicals are not used as part of the manufacturing process. The non-residential screening levels were derived by adjusting the residential values by a factor of 4.2 to adjust from a 168-hour week for the residential exposure to a 40-hour work week for the non-residential exposure. For industrial settings where the chemicals in question are used, OSHA permissible exposure limits or other occupational exposure values would apply.

Methane gas is explosive between its lower explosive limit (LEL) of 5 percent methane by volume in air and its upper explosive limit (UEL) of 15 percent by volume. At these levels, there is a ratio of methane to oxygen in air that allows for combustion to occur and an explosion hazard to exist if an ignition source is present in a confined indoor space. Based on Region 5 Vapor Intrusion Guidance, methane levels exceeding 10 percent of the LEL or 0.5 percent

methane by volume in the sub-slab soil gas are considered potential explosive situations that may need immediate action. For indoor air, methane results greater than 1 percent of the LEL or 0.05 percent methane by volume are levels where emergency actions may be undertaken. Because this is a physical hazard, these actionable levels would apply in both residential and commercial settings.

If you have any questions regarding these values, please contact John Kollman in my program at (614) 752-8335.

Thank you.

Sincerely,

Robert Frey, PhD  
Chief, Health Assessment Section, Ohio Department of Health

RF/jk

**Table 1. Screening Levels – South Dayton Dump**

Chemical of Concern	Residential		Source/Criteria	Non-residential		Source/Criteria
	µg/m³	ppb		µg/m³	ppb	
Indoor Air Screening Levels						
1,1-Dichloroethane	15	3.7	EPA RSL/C/10 <sup>-5</sup>	63	16	EPA RSL/C/10 <sup>-5</sup> x 4.2
Benzene	1	0.4	CREG/C/10 <sup>-5</sup>	4	2	CREG/C/10 <sup>-5</sup> x 4.2
Chloroform	100	20	ATSDR/NC	400	80	ATSDR/NC
cis-1,2-Dichloroethylene	35	8.8	OSWER/NC	150	37	OSWER/NC x 4.2
Ethylbenzene	300	60	ATSDR/NC	1,300	250	ATSDR/NC x 4.2
Tetrachloroethylene (PCE)	40	6	EPA RfC	170	25	EPA RfC x 4.2
Trichloroethylene (TCE)	2	0.4	EPA RfC	10	2	EPA RfC x 4.2
m,p-Xylene*	200	50	ATSDR/NC	800	200	ATSDR/NC x 4.2
o-Xylene*	200	50	ATSDR/NC	63	16	ATSDR/NC x 4.2
Vinyl chloride	1	0.4	CREG/C/10 <sup>-5</sup>	4	2	CREG/C/10 <sup>-5</sup> x 4.2
Methane (in percent = %)	0.05		Region 5 VI Guide	0.05		Region 5 VI Guide
Sub-slab Soil Gas Screening Levels						
1,1-Dichloroethane	150	37	EPA RSL/C/10 <sup>-5</sup> x 10	630	160	EPA RSL/C/10 <sup>-5</sup> x 10 x 4.2
Benzene	10	4	CREG/C/10 <sup>-5</sup> x 10	40	20	CREG/C/10 <sup>-5</sup> x 10 x 4.2
Chloroform	1,000	200	ATSDR/NC x10	4,000	800	ATSDR/NC x10 x 4.2
cis-1,2-Dichloroethylene	350	88	OSWER/NC x 10	1,500	370	OSWER/NC x 10 x 4.2
Ethylbenzene	3,000	600	ATSDR/NC x10	13,000	2,500	ATSDR/NC x10 x 4.2
Tetrachloroethylene (PCE)	400	60	EPA RfC x 10	1,700	250	EPA RfC x 10 x 4.2
Trichloroethylene (TCE)	20	4	EPA RfC x 10	100	20	EPA RfC x 10 x 4.2
m,p-Xylene*	2,000	500	ATSDR/NC x 10	8,000	2,000	ATSDR/NC x 10 x 4.2
o-Xylene*	2,000	500	ATSDR/NC x 10	8,000	2,000	ATSDR/NC x 10 x 4.2
Vinyl chloride	10	4	CREG/C/10 <sup>-5</sup> x 10	40	20	CREG/C/10 <sup>-5</sup> x 10 x 4.2
Methane (in percent = %)	0.5		Region 5 VI Guide	0.5		Region 5 VI Guide

\*ATSDR comparison value for total xylenes  
 $\mu\text{g}/\text{m}^3$  = micrograms per cubic meter  
 ppb = parts per billion  
 C = cancer  
 NC = noncancer

$10^{-5}$  = cancer risk of 1 in 100,000  
 CREG = cancer risk evaluation guide (ATSDR)\  
 RfC = EPA Reference Concentration  
 RSL = Regional Screening Level (EPA April 2012)



**Table 2. Action Levels – South Dayton Dump**

Chemical of Concern	Residential		Source/Criteria	Non-residential		Source/Criteria
	$\mu\text{g}/\text{m}^3$	ppb		$\mu\text{g}/\text{m}^3$	ppb	
Indoor Air Action Levels						
1,1-Dichloroethane	150	37	EPA RSL/C/ $10^{-4}$	630	160	EPA RSL/C/ $10^{-4}$ x 4.2
Benzene	10	4	CREG/C/ $10^{-4}$	40	20	CREG/C/ $10^{-4}$ x 4.2
Chloroform	1,000	200	ATSDR/NC x 10	4,000	800	ATSDR/NC x 10 x 4.2
cis-1,2-Dichloroethylene	350	88	OSWER/NC x 10	1,500	370	OSWER/NC x 10 x 4.2
Ethylbenzene	3,000	600	ATSDR/NC x 10	13,000	2,500	ATSDR/NC x 10 x 4.2
Tetrachloroethylene (PCE)	400	60	EPA RfC/NC x 10	1,700	250	EPA RfC/NC x 10 x 4.2
Trichloroethylene (TCE)	20	4	EPA RfC/NC x 10	100	20	EPA RfC/NC x 10 4.2
m,p-Xylene*	2,000	500	ATSDR/NC x 10	8,000	2,000	ATSDR/NC x 10 x 4.2
o-Xylene*	2,000	500	ATSDR/NC x 10	630	160	ATSDR/NC x 10 x 4.2
Vinyl chloride	10	4	CREG/C/ $10^{-4}$	40	20	CREG/C/ $10^{-4}$ x 4.2
Methane (in percent = %)	0.05		Region 5 VI Guide	0.05		Region 5 VI Guide
Sub-slab Soil Gas Action Levels						
1,1-Dichloroethane	1,500	370	EPA RSL/C/ $10^{-4}$ x 10	6,300	1,600	EPA RSL/C/ $10^{-4}$ x 10 x 4.2
Benzene	100	40	CREG/C/ $10^{-4}$ x 10	400	200	CREG/C/ $10^{-4}$ x 10 x 4.2
Chloroform	10,000	2,000	ATSDR/NC x 100	40,000	8,000	ATSDR/NC x 100 x 4.2
cis-1,2-Dichloroethylene	3,500	880	OSWER/NC x 100	15,000	3,700	OSWER/NC x 100 x 4.2
Ethylbenzene	30,000	6,000	ATSDR/NC x100	130,000	25,000	ATSDR/NC x100 x 4.2
Tetrachloroethylene (PCE)	4,000	600	EPA RfC/NC x 100	17,000	2,500	EPA RfC/NC x 100 x 4.2
Trichloroethylene (TCE)	200	40	EPA RfC/NC x 100	1,000	200	EPA RfC/NC x 100 x 4.2
m,p-Xylene*	20,000	5,000	ATSDR/NC x 100	80,000	20,000	ATSDR/NC x 100 x 4.2
o-Xylene*	20,000	5,000	ATSDR/NC x 100	80,000	20,000	ATSDR/NC x 100 x 4.2
Vinyl chloride	100	40	CREG/C/ $10^{-4}$ x 10	400	200	CREG/C/ $10^{-4}$ x 10 x 4.2
Methane (in percent = %)	0.5		Region 5 VI Guide	0.5		Region 5 VI Guide

\*ATSDR comparison value for total xylenes

$\mu\text{g}/\text{m}^3$  = micrograms per cubic meter

ppb = parts per billion

C = cancer

NC = noncancer

$10^{-4}$  = cancer risk of 1 in 10,000

CREG = cancer risk evaluation guide (ATSDR)\

RfC = EPA Reference Concentration

RSL = Regional Screening Level (EPA April 2012)